

A New Era for NOAA Environmental Satellites

2017 NOAA SATELLITE CONFERENCE

JULY 17-20, 2017

Panel Discussion: Training Resources

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UCAR's COMET Program

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Atmosphere*


Leroy Spayd

NWS – Chief Learning Office

José Manuel Gálvez

*Research Meteorologist
and Instructor*

Moderator: Janel Thomas (*GOES-R Product Readiness & Operations Training and User Liaison*)



A New Era for NOAA Environmental Satellites

2017 NOAA SATELLITE CONFERENCE

JULY 17-20, 2017

We will be using live polling during this panel
using **slido** code #:5699

COMET's MetEd Online Learning Resources for Environmental Satellites

Patrick Dills
UCAR's COMET Program

18 July 2017

Panel Discussion: Training Resources
New York City, NY



Distance Learning via the MetEd Website

← → ↻ <https://www.meted.ucar.edu> ★

English Español


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[HOME](#) [EDUCATION & TRAINING](#) [COMMUNITIES](#) [RESOURCES](#) [ABOUT](#) [MY METED](#)


Teaching and Training Resources for the Geoscience Community [Search](#)

What Is MetEd?

MetEd is a free collection of **hundreds of training resources** intended for the **geoscience community**. Whether you're an experienced meteorologist honing existing skills or a student looking for new geoscience topics of interest, we have something for you. Learn more about MetEd in this short [video](#).



Recent Publications



Advances in Space-Based Nighttime Visible Observation, 2nd Ed.

This updated one-hour lesson explores the types of atmospheric and surface features that can be observed at night. It describes recent technical improvements in nighttime visible imaging with the VIIRS Day/Night Band on board the Suomi NPP and JPSS satellites,...

[More Information »](#)

1 2 3 4 5 6 7 8 9 10 [See All](#)

Find What's Right for You

We offer many ways to locate training that's relevant to you. Browse by topic area, skill level, or use our search tool. Additionally, we have an extensive image library — a great resource for educators and trainers — accessible by using the search feature.

[All topics](#)

[Modules](#) [Courses](#)

News and Updates

MetEd lessons are multi-lingual!
Posted on: 2017-06-12

MetEd has always had a strong Spanish presence with a Spanish version of the site and over 130 lessons available in Spanish.


But we also have:


- more than 60 lessons available in French
- 3 lessons in Portuguese with several more currently in development
- 2...

[read more](#)

[Visit the News Archive](#)

Quick Links

 The COMET® Program

 COMET Virtual Classroom

- Users: 500,000+
- Universities: 2056
- International users: 169,863
- Over 600 lessons in over 20 Earth science topic areas
- Some available in other languages including:
 - Spanish (143)
 - French (75)
 - Portuguese (5)
 - and others recently added in German, Chinese, Indonesian

Satellite Meteorology Topic Area: Lessons and Courses...

The screenshot shows the COMET MetEd website interface. At the top, the logo and navigation menu are visible. The 'MY METED' link in the navigation bar is circled in red. Below the navigation bar, the 'Lesson/Resource Listing' section is shown. The 'Topics' dropdown is set to 'Satellite Meteorology' and the 'Languages' dropdown is set to 'English', both circled in red. The 'Lessons/Resources' button is also circled in red. The search results show two items: 'GOES-R Launch Workshop for Broadcast Meteorologists, November 2016' and 'SatFC-G: Foundational Course for GOES-R'. The 'GOES-R Launch Workshop' item has a thumbnail image and a description. The 'SatFC-G' item has a circular logo and a description. The 'Special Interest' section on the right highlights the 'JPSS Satellites: Capabilities and Applications Course'.

English Español

Hi, Patrick! [Your Account](#) [Logout](#)

HOME EDUCATION & TRAINING COMMUNITIES RESOURCES ABOUT **MY METED**

Lesson/Resource Listing »

Topics: Satellite Meteorology Languages: English

In this topic area, find out how current and future satellites and their sensors work, how to interpret what they tell us, and how to make forecasts and other weather products from their data.

Lessons/Resources Courses Sort by: Date (Newest to Oldest)

1 - 40 out of 91 results

GOES-R Launch Workshop for Broadcast Meteorologists, November 2016

GOES-R Launch Workshop for Broadcast Meteorologists, November 2016

This lesson consists of presentations by nine professionals from NOAA and NASA recorded at the GOES-R Workshop for Broadcast Meteorologists at Kennedy Space Center. The workshop was offered by StormCenter Communications, Inc. in partnership with the COMET Program in ... [Read more](#)

Languages: English
Publish Date: 2017-01-19
Skill Level: [2](#)
Completion Time: 5.00 - 6.00 h
Topics: Satellite Meteorology, Space Weather, Tropical/Hurricanes
[0 reviews](#)

SatFC-G: Foundational Course for GOES-R

Satellite Foundational Course for GOES-R: SatFC-G (SHyMet Full Course Access)

This Satellite Foundational Course for GOES-R (SatFC-G) is a series of nearly 40 lessons designed specifically for National Weather Service (NWS) forecasters and decision makers to prepare for the U.S.' next-generation geostationary environmental satellites. The course is ... [Read more](#)

Languages: English
Publish Date: 2016-11-21
Skill Level: [2](#)
Completion Time: 8.00 - 9.00 h
Topics: ...

This content is not hosted on MetEd.

Special Interest

[More on Satellite Meteorology](#)

MetEd offers 12 individual lessons on JPSS satellites, available through the JPSS Satellites: Capabilities and Applications Course.

JPSS Satellites: Capabilities and Applications Course

Subscriptions

[New Publications RSS](#)
[Mailing List](#)

About Our Training Resources

Our training consists of lessons and courses. A **lesson** is targeted toward one focused subject, whereas a **course** is a collection of lessons that pertain to a broader subject area. You can receive certificates of completion for both lessons and courses. Courses are entirely self-paced

- Lessons: 93
- SatMet lessons in other languages:
 - Spanish (34)
 - French (29)
 - Portuguese (3)
 - German (1)
- Courses: 8
- Courses in other languages:
 - Spanish (1)
 - French (1)
 - Portuguese (1)


Satellite Specific Lessons and Courses:

- Over 90 Satellite-specific lessons on MetEd, and four multi-lesson courses, one on GOES-R, another on JPSS (**94 ENG, 34 SPA, 29 FRA, 3 POR**)
- 5 unique multi-lesson courses, one on GOES-R, another on JPSS
- Over 20,000 English satellite lesson user sessions per year
- Recent publications:
 - 8 lessons for the “*SatFC-G Foundational Course for GOES-R*”
 - A distance learning course: “*JPSS Satellites: Capabilities and Applications Course*”
 - *Updated lesson, “Advances in Space-Based Nighttime Visible Observation, 2nd Ed.*



Audience Question

- **How would you like online educational resources to support your use of NOAA satellite products?**
 - a. Focused topic lessons that are engaging and highly interactive**
 - b. A mix of individual lessons and courses organized by topic area**
 - c. Series of short lessons focused on various satellite and remote sensing principles, from basic to advanced**
 - d. Other**



NOAA Satellite Conference Training Panel Discussion

The VISIT Program at CIMSS and CIRA

Scott S. Lindstrom

University of Wisconsin-Madison

Space Science and Engineering Center

Cooperative Institute for Meteorological Satellite Studies

What is VISIT / Who creates content

- Virtual Institute for Satellite Integration Training
 - Trainer and those being trained aren't in the same room
- Delivery methods include VISITview software, other webinars, blogs, Quick Guides, Fact Sheets...
- Scott Lindstrom and Scott Bachmeier (UW Madison)
- Dan Bikos, Ed Szoke, Bernie Connell (Colo. State U)
- Brian Motta and LeRoy Spayd at OCLO
- Several Emeritus members!

Learn more about VISIT on-line

VISIT Virtual Institute for Satellite Integration Training

VISIT Home

- VISIT Home
- Training Sessions
- Training Calendar
- Blog Sites
- VISIT Satellite Chat
- VISIT Satellite Help Desk
- The VISIT Program
- VISIT Contributors
- VISIT FAQ
- Links / Tutorials
- RAMSDIS Online
- VISIT Training DVD

Can total lightning help with warnings for non-supercell tornadoes?

Total lightning

Number of Sources

Time (UTC)

Northern Tornadoic Cell

Tornado

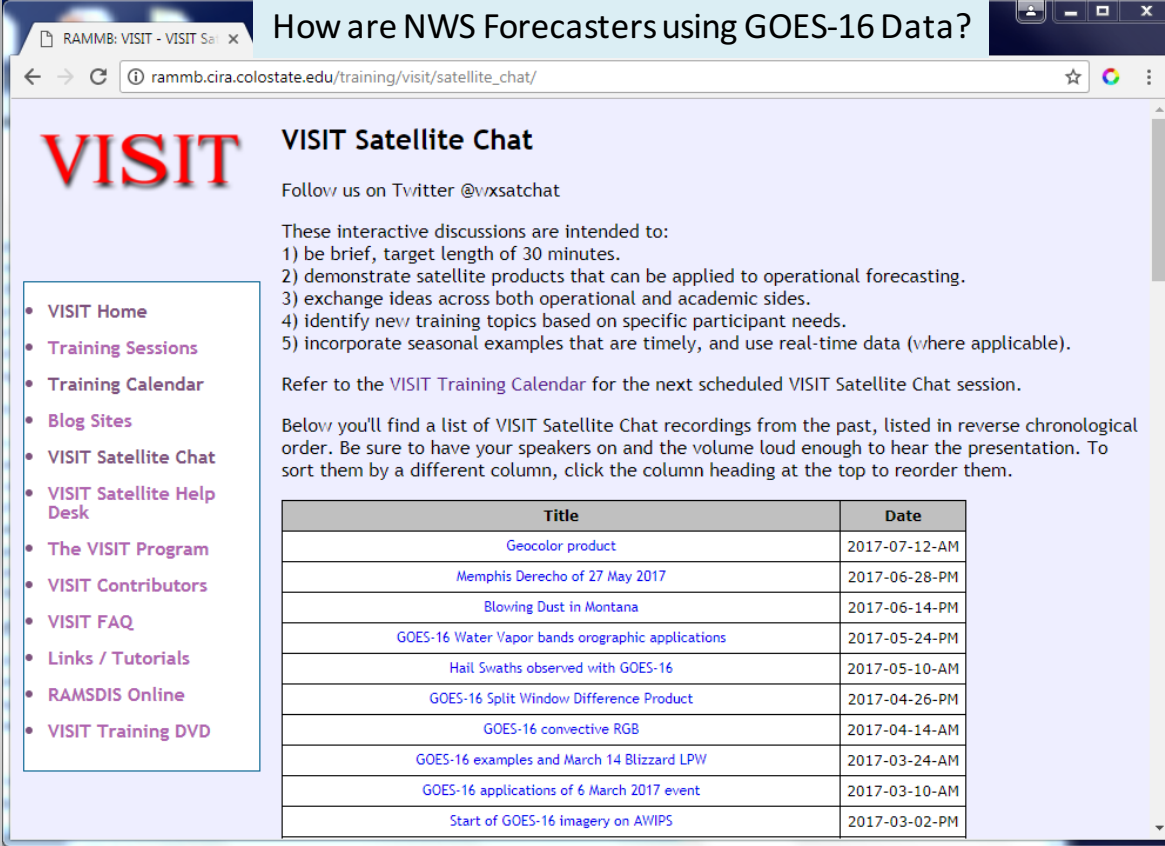
VISIT is a joint effort involving NOAA-NESDIS Cooperative Institutes, the National Environmental Satellite Data and Information Service (NESDIS), and the National Weather Service (NWS). The primary mission of VISIT is to accelerate the transfer of research results based on atmospheric remote sensing data into NWS operations using distance education techniques.

Teletraining Calendar, Signup and Installation

What's New?

EDIS, SHyMet, CIRA, RAMMB, CIMSS, COMET, SPORT

FDTD GOES-16 Webinars aka Satellite Chats

A screenshot of a web browser displaying the 'VISIT Satellite Chat' page. The browser's address bar shows the URL 'rammb.cira.colostate.edu/training/visit/satellite_chat/'. The page has a light blue header with the 'VISIT' logo in red and the title 'VISIT Satellite Chat'. A sidebar on the left contains a list of links: VISIT Home, Training Sessions, Training Calendar, Blog Sites, VISIT Satellite Chat, VISIT Satellite Help Desk, The VISIT Program, VISIT Contributors, VISIT FAQ, Links / Tutorials, RAMSDIS Online, and VISIT Training DVD. The main content area includes a Twitter link '@vxsatchat', a list of five goals for the interactive discussions, a reference to the 'VISIT Training Calendar', and a paragraph explaining that a list of past recordings is provided in reverse chronological order. Below this is a table with two columns: 'Title' and 'Date', listing various satellite chat sessions from 2017.

How are NWS Forecasters using GOES-16 Data?

VISIT

VISIT Satellite Chat

Follow us on Twitter @vxsatchat

These interactive discussions are intended to:

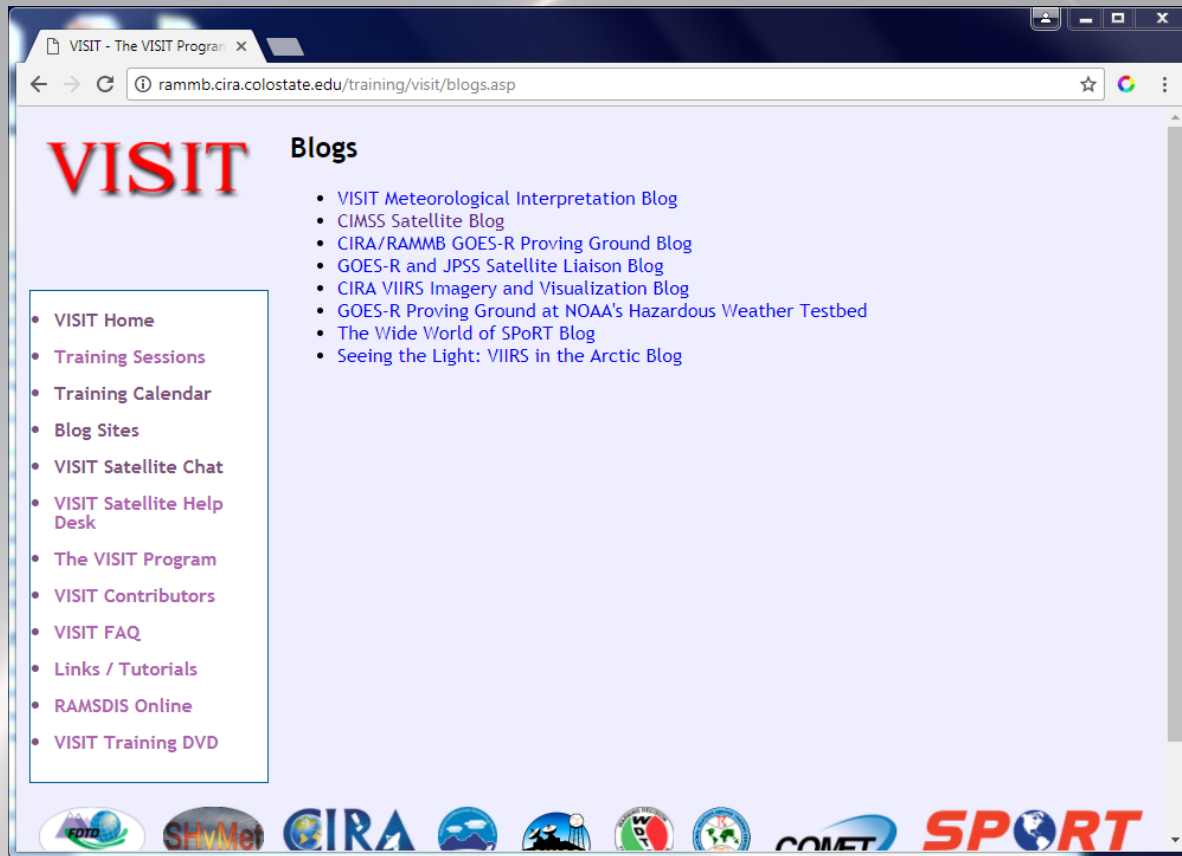
- 1) be brief, target length of 30 minutes.
- 2) demonstrate satellite products that can be applied to operational forecasting.
- 3) exchange ideas across both operational and academic sides.
- 4) identify new training topics based on specific participant needs.
- 5) incorporate seasonal examples that are timely, and use real-time data (where applicable).


Refer to the [VISIT Training Calendar](#) for the next scheduled VISIT Satellite Chat session.

Below you'll find a list of VISIT Satellite Chat recordings from the past, listed in reverse chronological order. Be sure to have your speakers on and the volume loud enough to hear the presentation. To sort them by a different column, click the column heading at the top to reorder them.

| Title | Date |
|---|---------------|
| Geocolor product | 2017-07-12-AM |
| Memphis Derecho of 27 May 2017 | 2017-06-28-PM |
| Blowing Dust in Montana | 2017-06-14-PM |
| GOES-16 Water Vapor bands orographic applications | 2017-05-24-PM |
| Hail Swaths observed with GOES-16 | 2017-05-10-AM |
| GOES-16 Split Window Difference Product | 2017-04-26-PM |
| GOES-16 convective RGB | 2017-04-14-AM |
| GOES-16 examples and March 14 Blizzard LPW | 2017-03-24-AM |
| GOES-16 applications of 6 March 2017 event | 2017-03-10-AM |
| Start of GOES-16 imagery on AWIPS | 2017-03-02-PM |

Blogs





Thank you for your attention!

Questions about VISIT?

scott.lindstrom@noaa.gov / dan.bikos@noaa.gov

GOES-R Proving Ground

Collaborative effort between the following...

- GOES-R Program Office
- NOAA Cooperative Institutes (CIMSS and CIRA)
- NASA SPoRT
- NOAA Testbeds
- NWS Forecast Offices and NCEP

User community is prepared for GOES-R imagery and data that has improved spectral resolution, spatial resolution, and temporal flash rate.

Emphasis on the R2O-O2R process

Demonstration products provide forecasters the opportunity to:

- become trained (preoperational)
- identify weaknesses and errors
- identify different utilities



GOES-R Proving Ground Training Overview

GOES-R Program has been committed to providing extensive training for the operational and educational communities.

Training has focused on...

- use of GOES-R data and products
- methods for interpreting GOES-R data
- better understanding of atmospheric sciences and mesoscale meteorology

Training has been developed and provided by a number of partners across the weather enterprise through the GOES-R Proving Ground, e-learning training modules, seminars, weather event simulations, and special case studies.



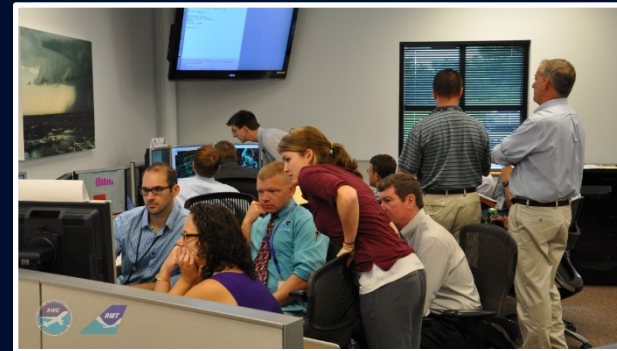
GOES-R Proving Ground Satellite Liaisons

GOES-R Program Office vision in 2005 was to fund 2-3 Satellite Liaisons that would be integrated side by side with forecasters at NCEP National Centers.

GOES-R implemented the Satellite Liaison position to...

- **prepare/train forecasters for data that will be available on GOES-R**
- **ease the transition of research to operations**
- **become the satellite subject matter experts at their respective facilities**

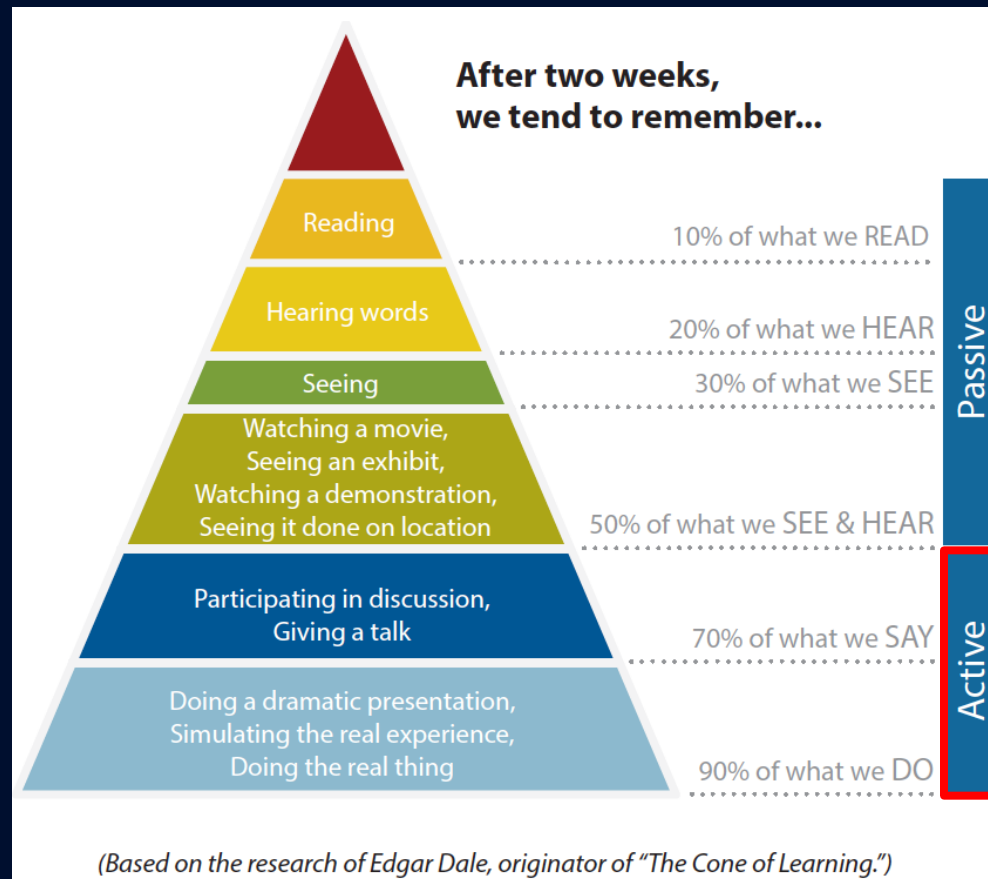
In 2008, the first Satellite Liaison was placed in the Storm Prediction Center.



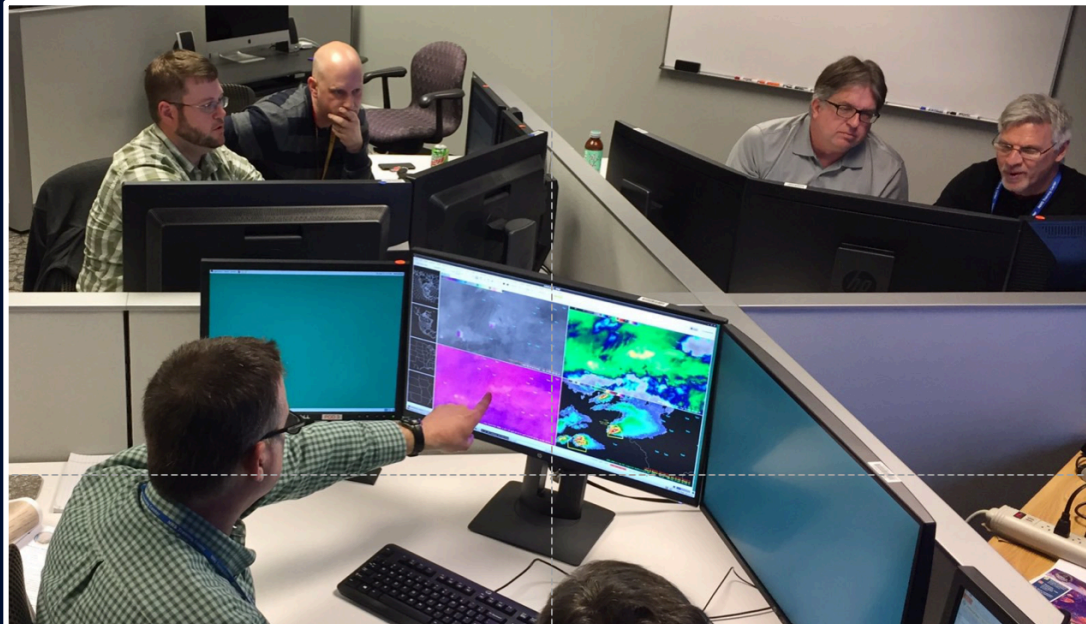
There are currently 8 Satellite Liaisons...

- **Storm Prediction Center**
- **Ocean Prediction Center, Weather Prediction Center, Tropical Analysis & Forecast Branch, Satellite Analysis Branch**
- **National Hurricane Center (1/2 time)**
- **Operations Proving Ground**
- **Alaska Region (1/2 time)**
- **Pacific Region (1/3 time)**

Cone of Learning



Cone of Learning



The key to creating a successful adult learning experience is "interactivity that engages the learner's mind to do those things that improve ability and readiness to perform effectively."

***Michael Allen,
Expert in Learning Research and Instructional Design***

NOAA's contributions to International Activities for Training in Satellite Meteorology via the WMO VLab

Bernie Connell

Cooperative Institute for Research in the Atmosphere



What is the WMO Virtual Laboratory for Education and Training in Satellite Meteorology?



A worldwide collaborative network connecting training Centres of Excellence (CoEs) and Satellite Operators

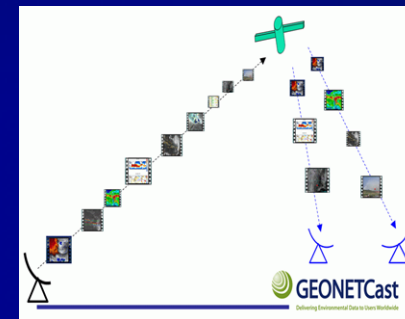
Mission: To improve the utilization of data and products from meteorological and environmental satellites.



VLab objectives



- To achieve better exploitation of data from the Space Based global observing system
- To globally share knowledge, experience, methods, and tools related to satellite data, *especially in support of WMO Members that have limited resources.*



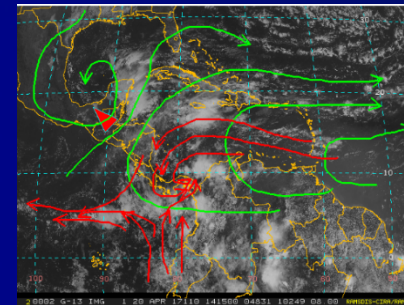
Training event at the CoE
Barbados May 2016

A few of the Key points of the VLab strategy 2015-2019



Provide support to education and training among WMO Members through:

- The delivery of Regional Focus Group (RFG) sessions
- The organization of Training Event Weeks
- Active support in the introduction of the new generation of satellites
- Encourage the translation of training material.



<http://rammb.cira.colostate.edu/vlab>

What is your biggest hurdle to understanding and using GOES-16 imagery and products?

- a. Having access to all GOES-16 image channels (Level 1 or Level 2 data)
- b. Having low cost access to image display and processing software.
- c. Having training resources in my native language.
- d. Having enough person resources and computer resources to implement the changes necessary to view and query the data (Level 1 or Level 2).
- e. Other ...

Cual es su principal dificultad para usar imagenes y productos del satelite GOES-16?

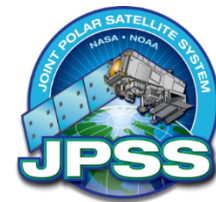
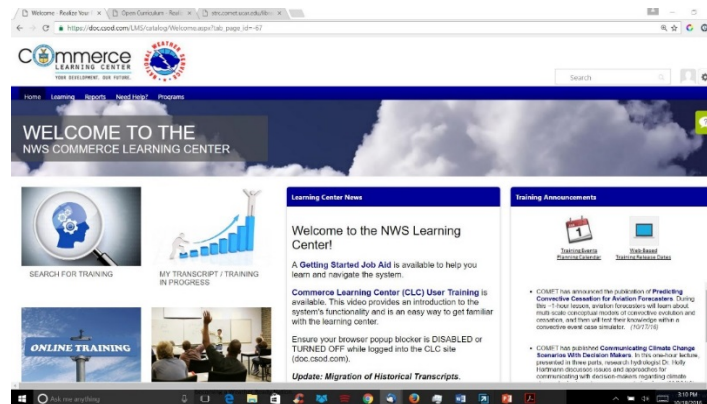
- a. Tener acceso a todos los canales de GOES-16 (Nivel 1 o 2)
- b. Tener acceso de bajo costo a software para procesar y desplegar imagenes.
- c. Disponibilidad de materiales de capacitacion en mi idioma.
- d. Escasez de recursos materiales y computacionales para utuilizar datos a Nivel 1 o 2.
- e. Otra ...



National Weather Service/NOAA

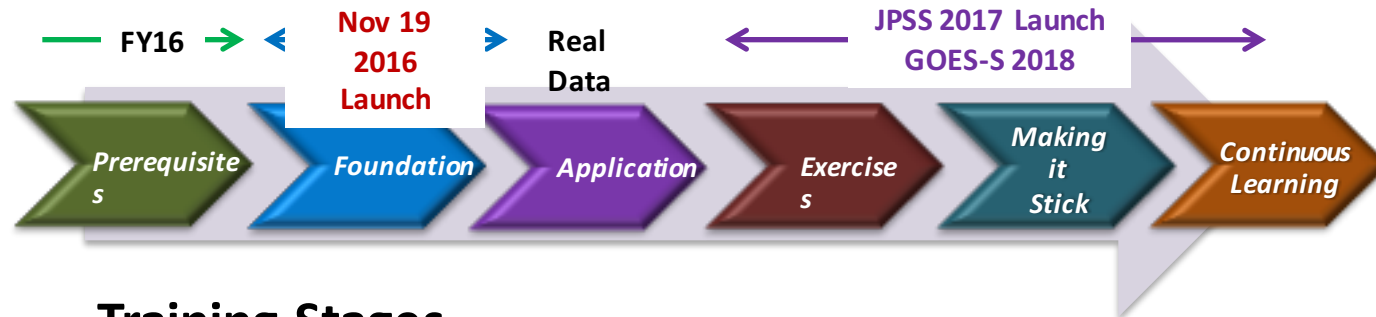
Leroy Spayd
NWS – Chief Learning Office

NOAA Satellite Conference
Training and Education Panel
Tuesday July 18, 2017





Satellite Training Timeline



Training Stages

- Prerequisites – overall basics
- **Foundation Course (8-15 hours) – satellite specifics**
- **Application – operational setting**
- **Exercises – simulations, practice**
- Making it Stick – multi-situational, sharing
- Continuous Learning – evolve and update

Satellite Foundational Course – 2000 completions in NWS (over 98%)

<https://doc.csod.com/phnx/driver.aspx?routename=Learning/Curriculum/CurriculumPlayer&TargetUser=2982&curriculumLoid=38f9dd8b-7f5e-4a75-ba82-7ae466744aa4#loaded>

Satellite Foundational Course for GOES-R (SatFC-G)

- ☒ GOES-R INTRODUCTION AND SATMET BACKGROUND
- ☐ ABI (ADVANCED BASELINE IMAGER)
- ☐ BASELINE PRODUCTS
- ☐ GLM (GEOSTATIONARY LIGHTNING MAPPER)
- ☐ MESOSCALE AND SYNOPTIC FEATURES

The GOES-R satellite will introduce a variety of new and improved capabilities compared to previous GOES satellites. The objective of this course is to address training needs associated with the new GOES-R satellite. Specifically, topics include an introduction to GOES-R highlighting improved spatial and temporal resolution and additional new channels that will be available, followed by products and imagery that address a broad range of applications.

For the first four (introductory) sections of the curriculum, you are required to complete the lessons and quizzes in the order they are listed. Each short lesson simply requires you to acknowledge that you have viewed it in order to attain "completed" status. The last item within each of the curriculum's seven main sections is a section quiz. For more on the mechanics of working through this curriculum, please see this tutorial. A separate curriculum will be used to track the WES-2 exercises associated with this course.

GOES-R Introduction and SatMet Background ⓘ
100% Completed: 4 Min Required: 4 Total Items: 4 [View Details](#)

ABI (Advanced Baseline Imager) ⓘ
34% Completed: 2 Min Required: 6 Total Items: 6 [View Details](#)

Baseline Products ⓘ
0% Completed: 0 Min Required: 8 Total Items: 8 [View Details](#)

GLM (Geostationary Lightning Mapper) ⓘ
0% Completed: 0 Min Required: 3 Total Items: 3 [View Details](#)

Satellite Foundational Course

Individual training modules are listed by "Title" and grouped under common topic categories. To sort by column, click the column heading at the top to reorder them. Length is given in minutes.

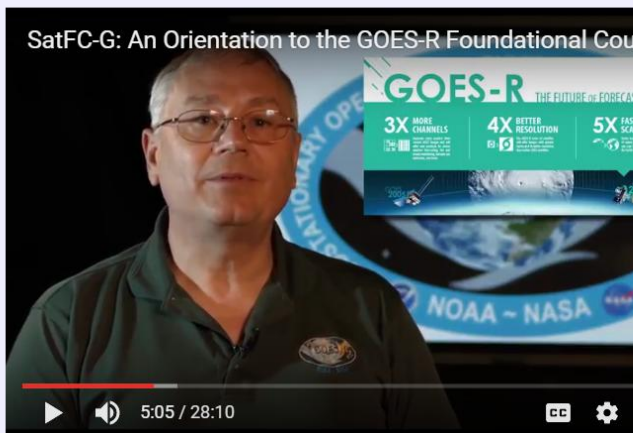
| Topic | Title | Length | Contributor | Developed |
|--------------|---|--------|---------------------------------|-----------|
| Introduction | Basic Principles of Radiation | 15 | COMET | 2016 |
| Introduction | Basic Operations of ABI on GOES-R | 15 | Lindstrom (CIMSS) | 2016 |
| Introduction | GOES-R ABI Visible and Near-IR Bands | 15 | COMET | 2016 |
| Introduction | GOES-R ABI Near-IR Bands | 15 | COMET | 2016 |
| Introduction | GOES-R ABI IR Bands, Excluding Water Vapor | 30 | COMET | 2016 |
| Introduction | GOES-R ABI Water Vapor Bands | 25 | Bikos & Szoke (CIRA) | 2016 |
| Introduction | GOES-R Multi-channel interpretation approaches | 30 | Lindstrom (CIMSS) | 2016 |
| Introduction | GOES-R Aerosols in AWIPS | 10 | Lindstrom (CIMSS) & Kondragunta | 2016 |
| Introduction | GOES-R Cloud and microphysical products, fog and low stratus | 15 | Lindstrom (CIMSS) | 2016 |
| Introduction | GOES-R Fire characterization, land surface temperature and snow | 10 | Lindstrom (CIMSS) | 2016 |
| Introduction | GOES-R Baseline Product: Hurricane Intensity Estimate | 10 | Dagg (CIRA) & Olander | 2016 |
| Introduction | GOES-R Baseline Product: Rainfall rate | 10 | Bikos (CIRA) & Kuligowski | 2016 |
| Introduction | GOES-R Baseline Product: Legacy Atmospheric Profiles | 10 | Lindstrom (CIMSS) | 2016 |
| Introduction | GOES-R Baseline Product: Derived Motion Winds | 10 | Lindstrom & Bachmeier (CIMSS) | 2016 |
| Introduction | GOES-R Baseline Product: Volcanic Ash | 10 | Lindstrom (CIMSS) & Pavolonis | 2016 |
| GLM | Introduction to the GLM | 30 | COMET | 2016 |
| GLM | Visualizing the Geostationary Lightning Mapper (GLM) in AWIPS | 10 | Stano (SPoRT) | 2016 |

Satellite Foundational Course - Orientation

2. YouTube video:



2. YouTube video:



JPSS

- SatFC-J being planned for NWS and external users – led by JPSS funded CIRA Satellite Liaison, NWS NOAT & STAT
- Learning Objectives completed – development underway
 - Introducing JPSS
 - Introducing Microwave remote sensing
 - Basic Forecast Applications
 - Product Applications



Questions?

For External Non-NOAA Users:

http://rammb.cira.colostate.edu/training/shymet/satfc-g_intro.asp

Register for course by sending email to:

nws.oaa.clo.shymet@noaa.gov

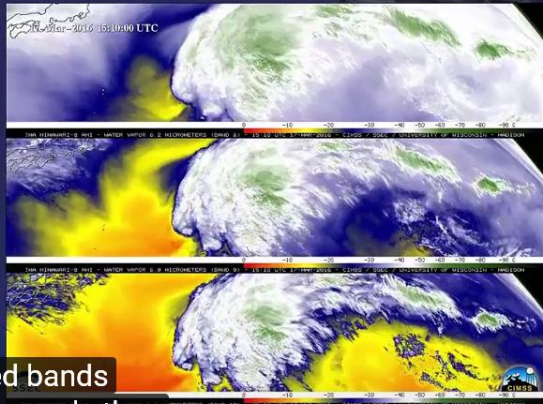
Orientation

Course structure

| Introduction | |
|----------------------------------|--------|
| Orientation | 25 min |
| Basic radiation principles | 15 min |
| Basic operation of GOES-R series | 15 min |

| ABI | |
|---------------------------------------|--------|
| Spectral bands in visible and near-IR | 15 min |
| Spectral bands in near-IR | 15 min |
| Spectral bands in IR | 30 min |
| Spectral bands in water vapor | 30 min |
| Multi-channel interpretation | 30 min |

you a tour of thermal infrared bands including the water vapor channels then



12:29 / 28:10

CC BY NC ND

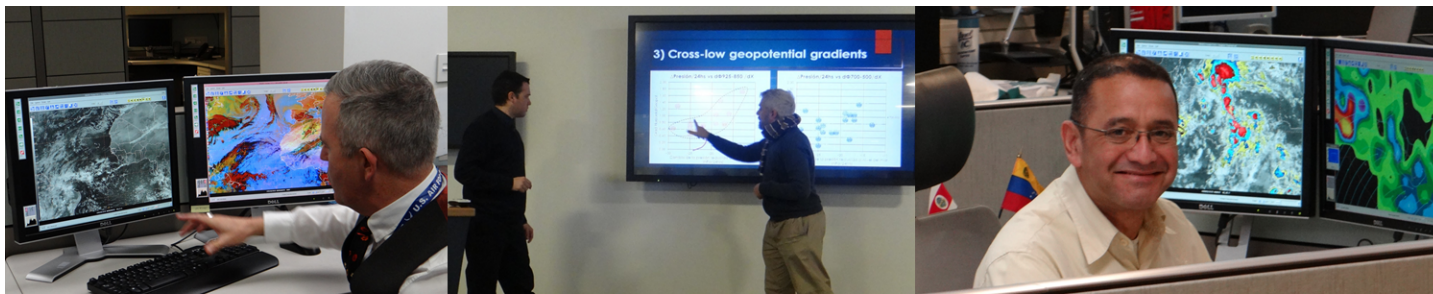
Audience question

- The most important aspect of GOES-16 to me is:
- 1. The info from the 11 additional bands
- 2. Increased resolution of the data
- 3. Fast scanning of high resolution sectors
- 4. Three water vapor bands instead of One



WPC International Desks /NWS/NOAA

Trainings on Weather Analysis and Forecasting since 1988



José Manuel Gálvez
Research Meteorologist and Instructor

NOAA Satellite Conference
Training and Education Panel
Tuesday July 18, 2017



The WPC International Desks

Trainings on Weather Analysis and Forecasting for the Americas



- **Training program for forecasters**
 - sponsored by the US State Department in partnership with the WMO and Met Services in WMO-RA III and IV (Americas), since 1988.
 - 2 desks: Tropical and South American, located at NCEP in College Park, MD.
- **Training focus:**
 - Concepts, methods and tools to analyze and forecast the weather with emphasis on QPF.
 - We **largely rely and train on interpretation of satellite imagery** and derived products.





Training Strategy

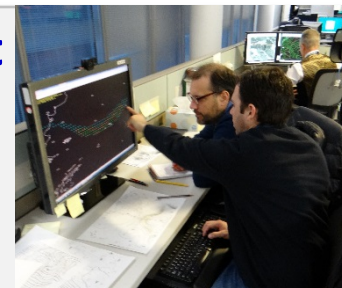


1. In-house training

- 4-month-long
- 2 fellows per desk
- Fellows staggered
- ~12 international fellows per year.

Train the trainer concept

Experienced fellows assist with the training of their peers, and are encouraged to become trainers when returning to their countries



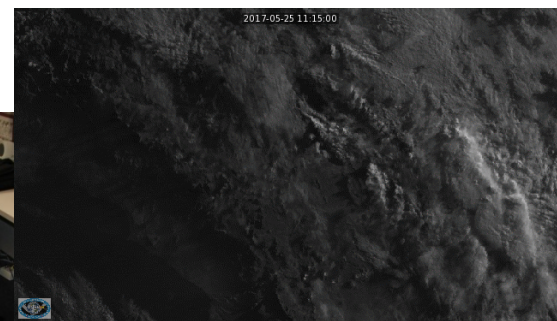
2. International Workshops

- 2-4 per year

3. Online training

- Vlab, once per month

Emphasis on satellite data analysis.





Goals and some numbers



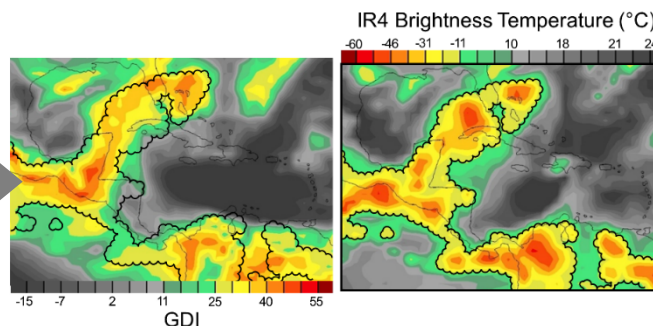
GOALS:

1. Enhance the scientific capacity of participating Met Services.
2. Fulfill the US NWS international commitment to provide numerical weather guidance to the Americas.
3. Tighten community relations.
4. Contribute to the science in the region (e.g. Galvez-Davison Index GDI for forecasting thunderstorms).

Statistics as of July 2017

| Desk | Years | Trainees |
|---------------------|------------|--------------------------|
| South American | Since 1988 | 172 (8 nations) |
| Tropical | Since 1992 | 152 (25 nations) |
| Saudi | 1999-2002 | 14 (Saudi Arabia) |
| Visiting Instructor | Since 2007 | 7 (4 nations) |

We have trained > 340 meteorologists



Sample of a GDI forecast vs cold clouds



*GTS=Global Telecommunications System



A lot to gain with GOES-16!



GOES-16 is largely improving our training and generation of guidance products



2017-07-12
17:45:38 UTC

☒ (L)oop ☐ (R)ock ☐ Rel(v)

Speed

☒ (M)aps ☐ LatLo(n) ☐ Slide(r)

(S)atellite GOES-16

Se(c)tor Full Disk

(P)roduct GeoColor (CIRA)

Add (O)verlay Add (O)verlay

of (I)Images 12

(T)ime Step 15 min

GeoColor (CIRA)

☐ (A)rchived Imagery

(B)egin D... Begin Ti...

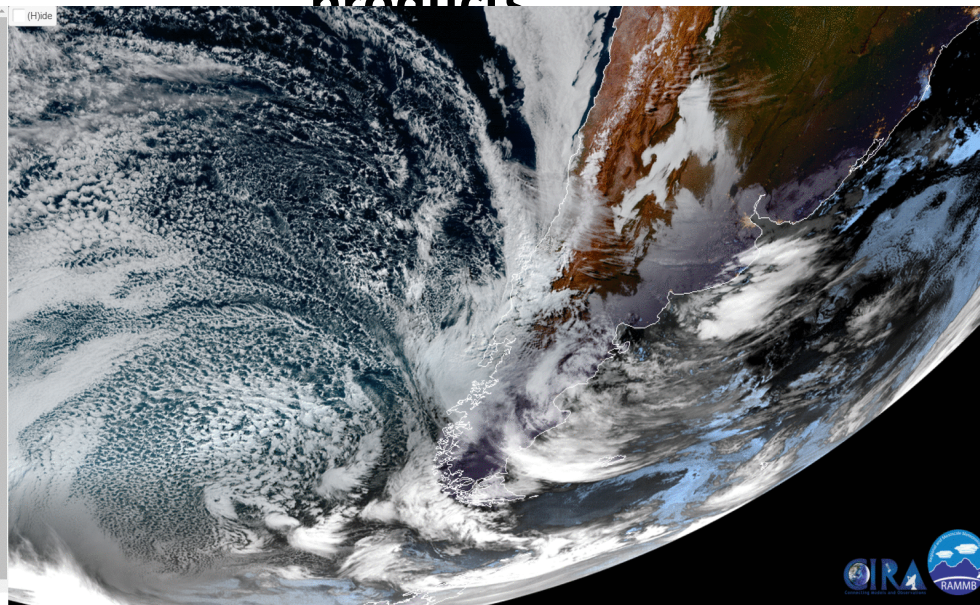
End Date... End Tim...

[SLIDER by RAMMB / CIRA @ CSU](#)

[Experimental Products Disclaimer](#)

NOAA's GOES-16 satellite has not been declared operational and its data are not for operational use.

2017-07-12 17:45:38 UTC



We can see more features that help our understanding of processes!



Engagement Question



From the advantages of GOES-16 for weather monitoring and forecasting, the following training activities should be emphasized in the Int'l desks:

- a. Interpretation of RGB channel combinations.
- b. Interpretation of processes now resolved by the improved spatial and temporal resolution.
- c. Application of lightning mapper data for severe weather detection.
- d. Description of the methods used to retrieve derived products (e.g. QPE, lightning data, winds, etc.) from satellite data.
- e. Other.



Thank you!

If you have any questions or would like further information, the panelists will be located at a table outside the Great Hall to speak with you